

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of the claims in the application:

Listing of Claims:

1 - 60. (Cancelled)

61. (Currently Amended) The ALD apparatus of claim ~~56~~ 78, wherein the controllable flow conductance is switchable from a first state to a second state.

62 - 63. (Cancelled)

64. (Currently Amended) The ALD apparatus of claim ~~56~~ 78, wherein the controllable flow conductance comprises a throttle valve.

65. (Previously Presented) The ALD apparatus of claim 64, wherein the throttle valve comprises an annular throttle valve located within the reaction chamber.

66. (Previously Presented) The ALD apparatus of claim 65, wherein the annular throttle valve includes multiple vanes, each having an axis therethrough.

67. (Previously Presented) The ALD apparatus of claim 65, wherein the annular throttle valve includes multiple blades arranged in an iris configuration.

68. (Previously Presented) The ALD apparatus of claim 65, wherein the annular throttle valve includes multiple blades, each having a number of holes therethrough, at least one of the blades being rotatable about an axis such that holes extending through the rotatable blade align with holes of at least one of the other blades to provide a passage through the annular throttle valve.

69. (Cancelled)

70. (Previously Presented) The ALD apparatus of claim ~~56~~ 78, wherein the controllable flow conductance is switchable under the control of a controller to switch states according to a

difference in residence times for passage of gas between (i) upstream gas sources and the reaction chamber, and (ii) the reaction chamber and the controllable flow conductance.

71 - 74. (Cancelled)

75. (Previously Presented) The ALD apparatus of claim ~~56~~ 78, wherein the controllable flow conductance is switchable under the control of a controller to switch states to maintain a nominally constant ratio between (i) gas flow pathway conductances upstream of the reaction chamber, and (ii) gas flow pathway conductances downstream of the reaction chamber during both exposure and purge periods of an ALD cycle.

76. (Canceled)

77. (New) An atomic layer deposition (ALD) apparatus, comprising:

- a reaction chamber having a wafer support disposed therein;
- a first gas flow pathway coupled between a first precursor source and the reaction chamber through a gas distribution apparatus disposed within the reaction chamber;
- a second gas flow pathway coupled between a second precursor source and the reaction chamber through the gas distribution apparatus disposed within the reaction chamber;
- a third gas flow pathway coupled between a first gas source different than the first and second precursor sources and the reaction chamber through the gas distribution apparatus disposed within the reaction chamber;
- a fourth gas flow pathway coupled between a second gas source different than the first and second precursor sources and the reaction chamber through the gas distribution apparatus disposed within the reaction chamber, the fourth gas flow pathway characterized by two separate, selectable gas flow pathways, one of which has a higher conductance than the other;
- and
- a pumping arrangement that includes a controllable flow conductance and a pump, the pumping arrangement being coupled downstream of the reaction chamber.

78. (New) The ALD apparatus of claim 77, wherein the third gas flow pathway is coupled between a first gas source different than the first and second precursor sources and the reaction chamber through portions of the first and second gas flow pathways.

79. (New) The ALD apparatus of claim 77, wherein the controllable flow conductance is switchable, under the control of a controller, in time phase with the two separate, selectable gas flow pathways of the fourth gas flow pathway during both exposure and purge periods of an ALD cycle.